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Factors affecting patients' compliance to endodontic clinics in Qassim University KSA

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ABSTRACT

Background: Failure to maintain an appointment at a university dental clinic impairs students' learning by occupying health resources that could be used by other patients, thereby impairing the quality of healthcare services. **Objective:** This study aimed to explore the factors of missed and cancelled appointments in endodontic clinic at Qassim University Saudi Arabia. **Methods:** A cross-sectional study was planned to collect data from patients visiting Al-Rass dental hospital. Data from patients who visited Al-Rass Dental Hospital was collected in this cross-sectional study. A self-administered questionnaire was distributed to participants using non-probability convenient sampling. The survey was designed to evaluate the factors responsible for cancelled or missed dental appointments. Data was analyzed using SPSS version 23. Percentage and frequencies were used to display the descriptive data. The Chi square was used to assess the relationship between the variables. **Results:** Among 249 patients, 218 were males and 31 were females. Data revealed that 75.1 percent of participants missed appointments, whereas 67.1 percent had canceled their dental appointments. A significant association was found between cancelled and missed appointment ($p < 0.00$) which showed that patient who cancelled their appointment are more likely to miss their appointment as compared to patient always attend their appointments on time. **Conclusion:** The appointment schedules at inconvenient time were the main reason to cancel or missed an appointment. Hence to reduce no-shows, patient education, convenient appointment time and frequent reminder is necessary.

Keywords: Missed dental appointments, Patient compliance, Cancelled appointments, Endodontics.

1. INTRODUCTION

In dental practice, no-shows for scheduled appointments are common, resulting in wasted appointment time and lowering the patient quality of care and access to dental services while increasing follow-up loss and medical expenses (Shabbir et al., 2018). Dental appointment no-show includes missed

and canceled appointments. Missed appointments are the ones that are not attended to or canceled by patients (Tsai et al., 2019). The most common reasons for non-attendance are a lack of transportation, time and forgetfulness (Storrs et al., 2016; Alzeghaibi et al., 2020). Patient variables associated with missed and canceled clinic appointments include ethnicity, age, gender, income and insurance (Miller-Matero et al., 2016).

Females were more likely to cancel or miss dental appointments due to family (childcare) demands taking precedence. Compared to older patients, young adults were more than four times more likely to cancel or miss appointments, which could be due to forgetfulness, work or other issues taking precedence, such as child care (Parker et al., 2012).

There is additional evidence that non-attendance levels vary according to location (urban/rural), socio-economic position, weather (season) and type of dental treatment. Non-attendance in rural clinical settings may be higher than in urban settings. This may be due to long travel distances, a lack of or sharing communication facilities such as telephones and cell phones and network coverage in a distant area. Depression and moodiness, as well as anxiety and tension, have been implicated in dental appointment cancellations. Non-attended appointments influence dental clinic operations. These consequences range from decreased productivity to lost income and clinical teaching hours (Lalloo and Mc-Donald, 2013).

The complexity of the dental treatment influences the majority of no-show dental visits, indicating that fear play a key role in this respect. Most dental patients were terrified of complex treatments (root canals and extractions), which occur infrequently compared to regular dental check-ups (Shabbir et al., 2018).

Missed or canceled appointments in a health care setting have significant productivity and economic consequences; therefore, efforts to reduce these must be implemented, such as telephonic reminders (calls or text messages) a day before or on the appointment day and educating the community on the importance of attending their appointments (Perry, 2011). It was also suggested to charge for missing appointments; however, this should be preceded with caution (Dubé-Baril, 2009; Al-Sadhan, 2013).

It is assumed that pain, fear and anxiety associated with endodontic procedures can be critical in compelling patients to miss or cancel appointments. Moreover, multiple visits for endodontic treatment and the length of the treatment procedure can be essential factors in patients skipping some scheduled visits. However, there has been no research study to date on patients' attendance patterns in restorative dental clinics. Therefore, this study aimed to investigate the incidence of missed and canceled appointments among active endodontic treatment patients at Qassim University's dentistry clinics.

2. MATERIALS AND METHOD

This study was approved from the Qassim University Ethical Review Board (ERB) number DRC/0011N/6-20. Using Epi Info Software version 1.4.3, sample size was measured with prevalence acceptance of 85%, error margin of 5% and confidence level of 95%. The minimum sample size needed for this study was 196 participants. Patients visiting the dental OPD Restorative Department from September 2021 to February 2022 were asked to complete a self-administered questionnaire using non-probability convenient sampling after providing their informed consent. The authors translated the questionnaire into Arabic for the patient who preferred answering in Arabic. Patients (male/female) attending the Restorative dentistry department were included, while patients who could not read or write were excluded from the study.

A valid and reliable questionnaire consisting of 14-items was adopted from Shabbir et al., (2018). Age, gender, education and profession were among the socio-demographic factors covered in the questionnaire's first section. While other parts of the questionnaire consist of questions related to methods of remembering appointments and reasons for cancelling and missing appointments. Choices related to cancelling and missed appointments are inconvenient timing, inability to get off work/school, Inability to get transport and Sickness, Fear and dislike of treatment. Certain questions in the questionnaire had several category choices of "yes/no/do not knows." A tick box layout was used to provide appropriate answers. SPSS version 23 was used for data analysis. Frequency and percentages were used to present qualitative data of missed and cancelled appointment. To evaluate the correlation among variables of interest, the Chi-square test was used. <0.05 was established as the level of significance.

3. RESULTS

A total of 249 questionnaires were distributed among the patients out of which 218 (87.6%) were males and 31 (12.4%), were females. With respect to occupation, 135 (54.2%) were students, 109 (43.8%) were employed and 5 (2.0%) were related to different professions. Nearly half of sample 135 (54.2%) was falling in the age group up to 25 years of age, 53 (21.3%) was in the age group from 25-35 years while 61 (24.5%) was > 35 years of age. Regarding education, 153 (61.4%) were studied in universities and 90 (36.1%) were studied in secondary, while 6 (2.4%) were illiterate persons (Table 1).

Table 1 Distribution of the sample by age, gender, occupation and education with methods used for remembering appointments

Demographic Variables (n=249)	Count (%)
Age (Years)	
Up to 25	135 (54.2)
26 to 35	53 (21.3)
36 or above	61 (24.5)
Gender	
Male	218 (87.6)
Female	31 (12.4)
Occupation	
Student	135 (54.2)
Employee	109 (43.8)
Others	5 (2.0)
Education	
Illiterate	6 (2.4)
Secondary	90 (36.1)
University and above	153 (61.4)
How do you remember your appointment date?	
Diary	27 (10.8)
Mobile	82 (32.9)
Calendar	25 (10.0)
Memory	48 (19.3)
Another Person	5 (2.0)
All of the Above	62 (24.9)
Reasons for cancelling dental appointments	
Inconvenient Timing	72 (28.9)
Unable to get off work/school	22 (8.8)
Unable to get transport	6 (2.4)
Sickness	5 (2.0)
Fear of Treatment	15 (6.0)
Dislike of Treatment	1 (0.4)
Other Reasons	46 (18.5)
Appointment not cancelled	82 (32.9)
Reasons for missing dental appointments	
Forgetfulness	47 (18.9)
Unable to get time from work/school	67 (26.9)
Unable to get transport	9 (3.6)
Sickness	6 (2.4)
Fear of Treatment	17 (6.8)
Dislike toward Treatment	5 (2.0)
Other Reasons	36 (14.5)
Appointment not missed	62 (24.9)

Of the surveyed sample, 48 (19.3%) respondents relied on their memory to remember their appointments, 82 (32.9%) used their mobiles as means of reminders, 27 (10.8%) relied on their diaries and 25 (10.0%) depends on the calendar while 62 (24.9%) relied on all of the above-mentioned methods to remember their appointments (Table 1). Upon asking for the reasons that why they have cancelled their dental appointments, 22 (8.8%) patients answered that they were unable to get time off from work/school, majority

of them 72 (28.9%) cancelled their appointment due to inconvenient timings, 46 (18.5%) cancelled due to some other reasons, while 82 (32.9%) of them did not cancel their appointments. On the other hand, when asked the reasons why they missed their dental appointments, 47 (18.9%) gave the reason due to forgetfulness, 67 (26.9%) were unable to get time off from work/school and 36 (14.5%) cancelled their appointments due to some other reasons, but 62 (24.9%) of them were not missed and availed their dental appointment (Table 1).

Regarding association between missed and cancelled dental appointments with respect to gender, it was found slightly significant association between male and female ($p=0.058$) while an insignificant association was reported between male and female in terms of reasons for missing dental appointments ($p=0.3$) (Table 2) (Figure 1).

Table 2 Association between missed and cancelled dental appointments with respect to gender

Variables (n=249)	Gender		P
	Male	Female	
	Count (%)	Count (%)	
Reasons for cancelling dental appointments			
Inconvenient Timing	65 (90.3)	7 (9.7)	0.058
Unable to get off work/school	21 (95.5)	1 (4.5)	
Unable to get transport	5 (83.3)	1 (16.7)	
Sickness	5 (100)	0	
Fear of Treatment	9 (60.0)	6 (40.0)	
Dislike of Treatment	1 (100)	0	
Other Reasons	40 (87.0)	6 (13.04)	
Appointment not cancelled	73 (89.0)	9 (11.0)	
Reasons for missing dental appointments			
Forgetfulness	46 (97.9)	1 (2.1)	0.3
Unable to get time from work/school	56 (83.6)	11 (16.4)	
Unable to get transport	8 (88.9)	1 (11.1)	
Sickness	5 (83.3)	1 (16.7)	
Fear of Treatment	14 (82.3)	3 (17.6)	
Dislike toward Treatment	5 (100)	0	
Other Reasons	31 (86.1)	5 (13.9)	
Appointment not missed	54 (87.1)	8 (12.9)	

With regard to association of reasons for cancelling dental appointments with respect to age groups, it was observed an insignificant association between the reasons for cancelling dental appointments ($p=0.118$). Furthermore, no statistically significant differences were found between missed and cancelled dental appointments in relation to education ($p=0.411$, $p=0.909$) respectively (Table 3) (Figure 2).

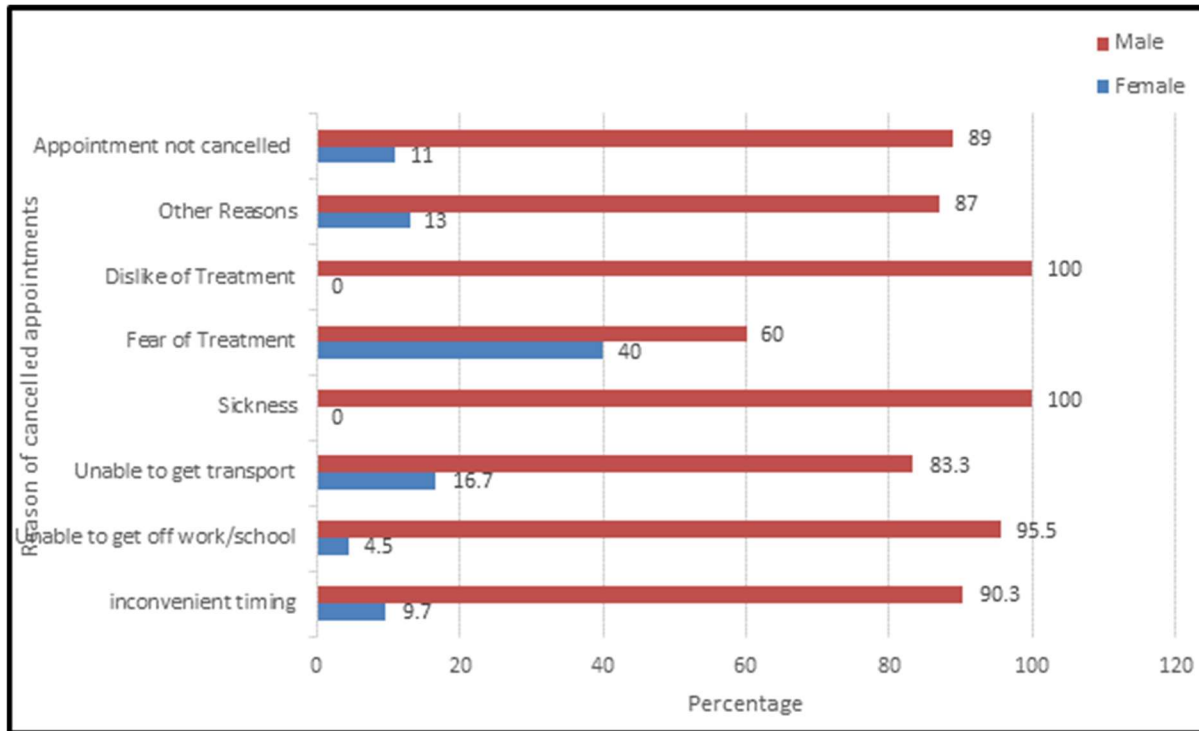


Figure 1 Graphical presentation of reason of cancelled dental appointments with respect to gender

Table 3 Association of reasons for cancelling and missing dental appointments with respect to age groups and educational status

Variables (n=249)	Age (Years)			p
	Up to 25	26 to 35	36 or above	
	Count (%)	Count (%)	Count (%)	
Reasons for cancelling dental appointments				
Inconvenient Timing	42 (58.3)	8 (11.11)	22 (30.55)	0.118
Unable to get off work/school	14 (63.6)	5 (22.7)	3 (13.6)	
Unable to get transport	5 (83.3)	0	1 (16.7)	
Sickness	4 (80.0)	1(20.0)	0	
Fear of Treatment	7 (46.6)	6 (40.0)	2 (13.33)	
Dislike of Treatment	0	0	1 (100.0)	
Other Reasons	30 (65.2)	9 (19.5)	7 (15.2)	
Appointment not cancelled	34 (41.5)	26 (31.7)	22 (26.8)	
Variables (n=249)	Education			P
	Illiterate	Secondary	University and above	
	Count (%)	Count (%)	Count (%)	
Reasons for cancelling dental appointments				
Inconvenient Timing	5 (6.9)	19 (26.4)	48 (66.7)	0.411
Unable to get off work/school	0	11 (50.0)	11 (50.0)	
Unable to get transport	0	3 (50.0)	3 (50.0)	
Sickness	0	2 (40.0)	3 (60.0)	
Fear of Treatment	0	7 (46.7)	8 (53.3)	
Dislike of Treatment	0	0	1 (100)	
Other Reasons	0	15 (32.6)	31 (67.3)	
Appointment not cancelled	1 (1.2)	32 (39.02)	49 (59.7)	
Reasons for missing dental appointments				
Forgetfulness	0	18 (38.3)	29 (61.7)	0.909

Unable to get time from work/school	3 (4.5)	24 (35.8)	40 (59.7)
Unable to get transport	0	5 (55.6)	4 (44.4)
Sickness	0	1 (16.7)	5 (83.3)
Fear of Treatment	0	6 (35.3)	11 (64.7)
Dislike toward Treatment	0	1 (20.0)	4 (80.0)
Other Reasons	2 (5.6)	15 (41.7)	19 (52.7)
Appointment not missed	1 (1.6)	21 (33.9)	40 (64.5)

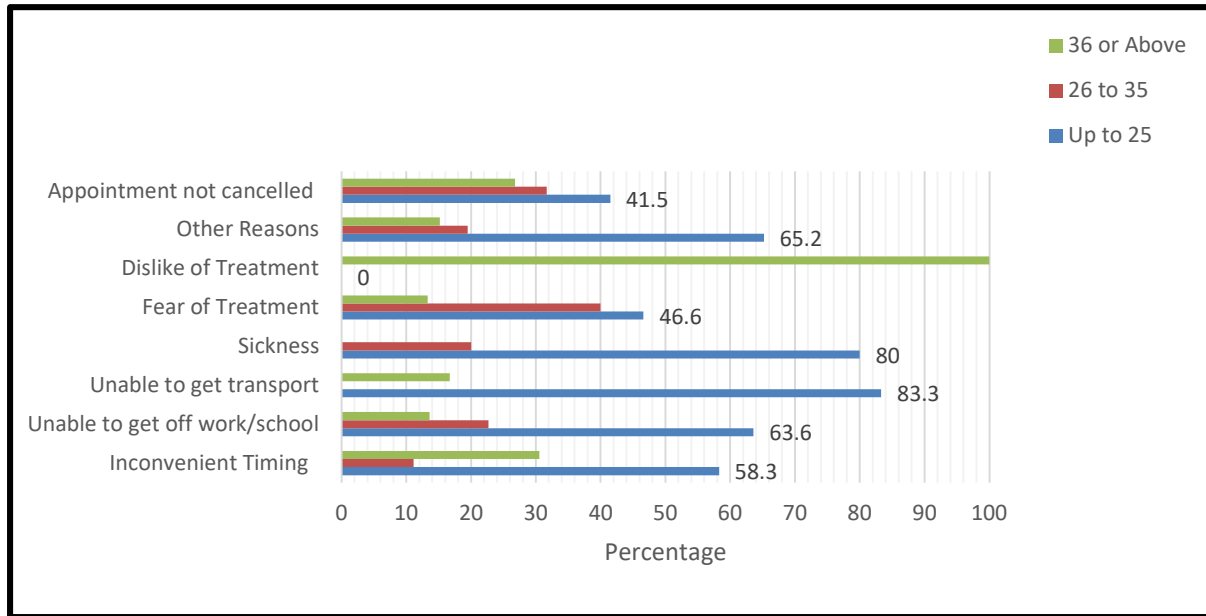


Figure 2 Graphical presentation of reason for cancelling dental appointments with respect to age groups

Concerning reasons for association between missed and cancelled appointments, there was a significant association was found between them ($p < 0.001$) (Table 4).

Table 4 Association between missed and cancelled dental appointments

		Have you ever missed an appointment			P-value
		Yes	No	Total	
Have you ever cancelled an appointment?	Yes	138 (82.6%)	29 (17.36%)	167 (67.06%)	<0.001
	No	48 (58.5%)	34 (41.5%)	82 (33.9%)	
	Total	186 (74.7%)	63 (25.3%)	249 (100.0%)	

4. DISCUSSION

Identifying reasons for a no-show at a scheduled appointment is very common, resulting in decreased patient quality of care, access to services and rising medical costs (Levin, 2012). This study aimed to investigate the factors responsible for patients missed and cancelled dental appointments (Shabbir et al., 2018).

The overall rate of missed appointments was 75.1% higher than the 58.1% and 24.8% and 42.6% reported in previous studies conducted in Saudi Arabia and 36.8% in India, 22.5% in UAE (Ismail et al., 2011; Tandon et al., 2016). This research found that 67.1% of participants cancelled their dental appointments; similarly, the frequency of cancelled appointments was 63.5% and 73% of studies conducted in Saudi Arabia (Al-Sadhan, 2013; Shabbir et al., 2018).

The most common way of remembering the appointment date and time was to store the cellular phone information, then make a mental note and maintain a diary (Al-Sadhan, 2013). Despite using mobile devices to remember appointments, a high percentage of individuals in this study missed their dental appointments (Shabbir et al., 2018). The reason indicates that the appointments

given time were not suitable for patients. The frequent reason for missed dental appointments was unable to get time from work/school, which is in line with the findings of most of the previous studies (Al-Sadhan, 2013; Shabbir et al., 2018).

Furthermore, we discovered that just 6.8% of patients were afraid of dental treatment, whereas 3.6 percent of missed appointments were due to a lack of transportation. These findings are in line with those of other research in which patients report a lack of transportation as a cause for missed dentist appointments (Al-Sadhan, 2013; Shabbir et al., 2018). Inconvenient timing was the common reason for cancelled appointments. A study in Riyadh region Saudi Arabia found that 80.6% of the patient didn't show up in the morning timing between 8:00 am to 10:00 am (Alabdulkarim et al., 2022).

Regarding cancelling dental appointments, 28.9% of participants reported that inconvenient timings were the most common reason, which indicates that if these patients were given appointments at different timings, there would be fewer chances of cancelling their appointments (Laloo and Mc-Donald, 2013; Storrs et al., 2016; Shabbir et al., 2018).

On the other hand, only 8.8% reported having canceled appointments because they were unable to get off work/school. The results of other studies showed that being unable to get off work/school was the most common reason for canceling appointments. The most probable explanation was that those studies were conducted before the COVID-19 pandemic, as during this pandemic, most of the work was performed with limited staff attendance (George et al., 2007; Al-Sadhan, 2013).

There was a significant relationship between cancelled and missed appointments ($p < 0.00$), indicating that patients who cancelled their appointments were significantly more likely to miss an appointment (82.6 percent) than patients who never cancelled their appointments (58.5 percent). Our results were in agreement with studies conducted in Saudi Arabia (Shabbir et al., 2018).

There was an insignificant association between gender and attendance patterns. In our study, men cancelled appointments at a higher rate than women. The reason was that in our sample, there were more male participants compared to females. Our findings are consistent with the previous studies (Skaret et al., 1998; Storrs et al., 2016; West et al., 2020).

Regarding age and educational status, we did not find any significant association between cancelled or missed appointments. However, other studies found that young patients were six times more likely to cancel or miss appointments than older participants (Storrs et al., 2016; Bellucci et al., 2017; White et al., 2021).

In the practice of dentistry, the patient's appointment characteristics are strongly associated with missed or cancelled appointments and they demand more attention when making an appointment. The missed or cancelled dental appointment may result in disruption of patients' treatment to a large extent. Therefore, the dental team must effectively communicate with their patients on the first day of their appointment by emphasizing the dental visit's importance and treatment outcome. To improve attendance, the dental clinic should implement an automated reminder system in which patients receive an SMS 24 hours before their appointment (Levin, 2012). There are some limitations to this study. First, the sample size was limited and collected from a single center. Secondly, our data was more gender-segregated as there were more male participants as compared to females.

We suggest that further research should be multicenter on a larger sample size, including public and private institutions, to investigate the factors responsible for poor attendance patterns so steps can be taken to prevent them. Moreover, we must take into account the factors, such as the attendees' socioeconomic and mental health status, that we were unable to address in this study.

5. CONCLUSION

This study indicates a high prevalence of patients missing or canceling dental appointments in a subgroup population of Saudi Arabia's Qassim region. Since the primary reason for missed appointments was appointments scheduled at inconvenient times, steps to reduce missed or cancelled appointments should include sending reminder messages to patients via an automated reminder system in which patients should receive an SMS before their appointment.

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Author Contributions

Conceptualization: MASA and ANNA

Methodology: MASA, ANNA and SFM

Formal analysis: MASA and SFM

Data curation: MASA and ANNA

Writing—original draft preparation: MASA, SFM, ANNA and SS

Writing—review and editing: MASA, SFM, ANNA and SS

Supervision: MASA

All authors have read and agreed to the published version of the manuscript.

Ethical approval

The study was approved by the Qassim University Ethical Review Board (ERB) number DRC/0011N/6-20.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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